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and by the presence of eight-spored asci derived from an isogamous conjugation. According to ENGLER and PRANTL, *Olinea* also differs from *Endomyces* in the number of its spores, but this is not an essential character, because in two species of *Endomyces* there are four to eight spores.

On account of the great resemblance between *Endomyces fibuliger* and *Saccharomyces capsularis*, the latter is placed by the author in the genus *Endomyces*, which differs from the yeasts in the great differentiation of its mycelium and by having its asci arise almost always from the ends of mycelial branches and not from conidia. The genus *Endomyces* is characterized by a tendency of the mycelium to form conidia or oidia and by the asci arising from the ends of mycelial branches.

The yeasts are thought to be descended from a form similar to *Eremascus fertilis*. From it there are two main lines, one of which again branches to give rise to *Saccharomyces*, *Zygosaccharomyces*, and *Endomyces fibuliger* and *E. capsularis*; while the other main branch gives rise to *Schizosaccharomyces*, *Endomyces magnusii*, and *E. diciptens*.—FREDA M. BACHMAN.

Vegetation of the Faeröes.—Several years ago Professor WARMING and his colleagues projected a systematic study of the flora of the Faeröes from various points of view, and there have been published in a special serial devoted to the purpose papers dealing with plant lists of various groups, floristic treatises, and the like. For ecologists the most important paper of the series thus far is one by OSTENFELD¹⁴ on the plant associations and their life conditions, representing a translation of an earlier Danish paper, published in 1906. After reviewing the literature and noting that the best previous account of the vegetation is in ROSTRUP'S work published in 1870, OSTENFELD considers the climatic and edaphic factors in some detail. The climate is decidedly insular, the rainfall and humidity being high and the winter temperature so frequently above 0° that the snow cover is not permanent; the average number of rainless days is 85, while only 18 days per annum are clear. The abundance of sheep is responsible for a high degree of modification in the vegetation covering. In a chapter on the biological features the plants are classified according to their biological type (in the sense of RAUNKIAER), duration of life, type of vegetative propagation, and altitudinal distribution. There are no trees on the islands and there is a striking dominance of perennial herbs; only one autophytic species of the natural land vegetation (*Koenigia islandica*) is an annual. Thirty-six species have never been known to produce viable seeds; this is partly due to climate and partly to the absence of such important pollinating insects as bees and butterflies.

The body of the work deals with the plant formations, which are closely related to one another and separable with difficulty; the author regards this as a feature of an insular climate, which seems reasonable to the reviewer, who has

¹⁴ OSTENFELD, C. H., The land vegetation of the Faeröes, with special reference to the higher plants. Botany of the Faeröes 3:867-1026. figs. 31. 1908.

found similar situations in humid climates generally. The chief categories of natural formations are halophile, subalpine, alpine, and the sea-fowl cliffs, and all but the latter are further subdivided. The halophytic formations are much as elsewhere, and the subalpine formations are mainly those of ponds, swamps, moors, heaths, and cliffs. The cliffs are of much interest, since there is a luxuriant vegetation on sunny southern slopes, while there is a poorer vegetation, mainly of shade mosses, on north slopes. Of rather more interest than usual are the culture formations, the most important of which is the grass meadow. One of the most striking features of the islands is the roof vegetation, which has always been mentioned by travelers; the inhabitants thatch the roofs with grass turf, and very characteristic roof associations develop. The custom of the people is to sow potatoes in cleared ground for two years, after which barley is grown, whereupon the field is left fallow; under the heading "Metamorphic formations," OSTENFELD traces the history of such areas into the grass meadow.—H. C. COWLES.

Some plant diseases.—LANG¹⁵ has given a detailed account of the biology of *Ustilago Triticis* Jens., which, as BREFELD has shown, is peculiar and almost unique among the fungi on account of its habit of infecting the ovule and remaining dormant in the seed until the latter germinates. LANG finds that the spores of this fungus placed upon the stigmas of wheat flowers just opened germinate readily, but the germ tubes show no tendency to penetrate the stylar tissue. Only when the papillae of the stigma have begun to wither and collapse can the germ tubes penetrate between the cells. The fungus apparently has no power of penetrating the sound turgid tissue, a fact which has an interesting bearing in view of the usually strict parasitism of the vegetative phase in this group. The germ tube, without branching, makes its way down the intercellular spaces of the style, or sometimes down the canal formed by the pollen tube, and penetrates the inner integument near the micropylar end, the outer integument having mostly disappeared by that time. When the hyphae reach the chalazal region, they become branched and nodular, apparently showing greater vigor of growth in the region of more abundant nourishment. About three weeks after infection the fungus has reached the embryo. At first it spreads through the scutellum, but later the mycelium pervades every part of the embryo except the radicle. This stage is attained simultaneously with the ripening of the grain. The mycelium remains dormant in the ripe seed, and, when the latter germinates, progressively infects the growing points of the plant, but causes no apparent injury until spores are formed in the ovaries.

GÜSSOW¹⁶ reports the appearance in Newfoundland of a potato disease known as "cauliflower disease" or "potato-canker." The disease is caused by a chytri-

¹⁵ LANG, WILHELM, Die Blüteninfektion beim Weizenflugbrand. Centralbl. Bakt. II. 25:86-101. pl. 1 (double). figs. 2. 1909.

¹⁶ GÜSSOW, H. T., A serious potato disease occurring in Newfoundland. Cent. Exp. Farm, Depart. Agric., Ottawa, Canada. Bull. 63. pp. 8. pls. 2. fig. 1. 1909.